IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of

Nitin Nayak et al.

Serial No. 09/781,279

Filed February 13, 2001

For METHOD AND SYSTEM FOR FORMING DYNAMIC VENDOR COALITIONS IN COLLABORATIVE e-COMMERCE

Confirmation No. 9443

Group Art Unit 3624

Examiner Jagdish Patel

Box Non-Fee Amendment
Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

DECLARATION UNDER 37 C.F.R. 1.131
OF NITIN NAYAK

Sir:

Nitin Nayak declares as follows:

1. I am one of the named co-inventors of the invention disclosed in the above-identified patent application.

2. I and my co-inventor, Annap Derabail, made the invention in the United States of America as part of our duties as employees of the International Business Machines Corp.

3. The invention was conceived and actually reduced to practice prior to October 2000. Attached as Exhibit A is a copy of Invention Disclosure YOR8-2000-0689 which was submitted to the Intellectual Property Law Department of the T. J. Watson Research Laboratories of the International Business Machines Corp. The disclosure was submitted prior to October 2000 and was assigned the docket number YOR9-2000-0574 when it was rated to file as a patent application.

4. The attached written description and diagrams of Exhibit A disclose the invention as actually reduced to practice. Before October 2000, my team and I developed the understanding to reduce the invention to practice in the form of software for Virtual Corporation Management System. Exhibit B, labeled Figure 1, is a snapshot from an early version of the software as developed prior to October 2000. At this stage, the following features had been implemented within the software:

- Ability to create request for proposal (RFP) by customer through multiple devices;
- Ability to translate customer requirements into demanded capabilities;
- Ability to match demanded capabilities to vendor capabilities;
- Ability to inform selected vendors of request for proposal via e-mail;
- Ability to create quote in response to request for proposal by vendors;
- Ability to award proposal to one or more vendors by customer; and
- Ability to view the status of the above process in terms of stages of its completion for each instance of the submitted RFP.

Exhibit B is a snapshot showing how a customer creates a request for proposal. The entire screencam of the operation of this software demonstrating the above mentioned features is also available for viewing if requested.

5. By early January 2001, the implementation of the following features was completed in the software as evidenced within Exhibit C, labeled Figure 2, which is a snapshot from a screencam of the software demonstration. At this stage, the following features were implemented within the software:

- Ability to create request for proposal by customer through multiple devices;
- Ability to translate customer requirements into demanded capabilities;
- Ability to match demanded capabilities to vendor capabilities;
- Ability to inform selected vendors of request for proposal via e-mail;
- Ability to respond to request for proposal by vendors;

- Ability to award proposal to one or more vendors by customer;
- Ability to view the status of the above process in terms of stages of completion;
- Ability digitally sign the response to customer RFP;
- Ability to divide a customer RFP into sub-requests by a vendor with no restriction on the number of levels at which such division is performed;
- Ability to manage an n-level RFP tree corresponding to all sub-requests generated through multiple divisions of the original RFP in terms of controlling access and viewing status;
- Ability to use the above features to get responses from other vendors against the sub-RFPs;
- Ability to create coalitions to respond to a RFP at any level of division;
- Ability to aggregate coalitions to form a n-level coalition tree corresponding to the n-level RFP tree; and
- Ability to provide services to every coalition to assist in the creation of the response to RFP such as access to information sources, teamrooms for discussion, etc.

Exhibit C shows how a user can access the various sub-RFPs and associated quotes in response to these requests in the form of an RFP tree. Exhibit D, labeled Figure 3, depicts an n-level coalition tree using two snapshots from a screencam. The entire screencam of the operation of this software showing the above mentioned features is also available for viewing if requested.

6. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-referenced application and any patent issuing thereon.

Date 4/11/06

Nitin Nayak

EXHIBIT

A

Disclosure YOR8-2000-0689 YOR9-2000-0574

Created By: Nitin Nayak **Created On:**
Last Modified By: Nitin Nayak **Last Modified On:**

*** IBM Confidential *** PPM 600

Required fields are marked with the asterisk (*) and must be filled in to complete the form .

Summary

Status	Under Evaluation
Processing Location	YOR
Functional Area	900 Goyal-Systems & Software
Attorney/Patent Professional	Stephen C Kaufman/Watson/IBM
IDT Team	Stephen C Kaufman/Watson/IBM
Submitted Date	
Owning Division [redacted]	RES
PVT Score [redacted]	To calculate a PVT score, use the 'Calculate PVT' button.
Incentive Program	
Lab	
Technology Code	

Inventors with Lotus Notes IDs

Inventors: Nitin Nayak/Watson/IBM, Annap Dereball/Atlanta/IBM

Inventor Name > denotes primary contact	Inventor Serial	Div/Dept	Manager Serial	Manager Name
> Nayak, Nitin	631588	22/Z9DB	889928	Bhaskaran, Kumar
Dereball, Annap	827648	05/HPZA	1A1273	Henry, Elaine F.

Inventors without Lotus Notes IDs

IDT Selection

IDT Team:	Attorney/Patent Professional:
Stephen C Kaufman/Watson/IBM	Stephen C Kaufman/Watson/IBM

Response Due to IP&L :

Main Idea

*Title of disclosure (in English)

A Method and System for Forming Dynamic Vendor Coalitions in Collaborative e-Commerce

*Idea of disclosure

1. Describe your invention, stating the problem solved (if appropriate), and indicating the advantages of using the invention.

Problem Solved by This Invention

In today's dynamic net-generation business environment, the window of opportunity is shrinking for many businesses due to the time and space compression effect of the Internet. In the face of intense competition, businesses are faced with the need to rapidly re-configure themselves over and over again as they strive to introduce new products and processes. In this paper, we present an alternative to business re-configuration, namely formation of dynamic alliances. Dynamic networks of alliances (or coalitions) are formed between vendors with complementary capabilities to jointly pursue specific market opportunities. Such alliances are created primarily for the purpose of satisfying a market opportunity and disbanded after the opportunity has been satisfied. Although most alliances will be short-term in nature, traditional long-term business relationships can also evolve in some cases. We are currently developing the Internet infrastructure and process to support the formation of dynamic alliances to be implemented through our Virtual Enterprise Server. This invention describes a unique method for formation of dynamic vendor coalitions over the Internet.

2. How does the invention solve the problem or achieve an advantage,(a description of "the invention", including figures inline as appropriate)?
The invention is a process and a system for forming dynamic vendor coalitions from a pre-qualified set of vendors. It is assumed that the input for vendor coalition formation is pre-qualified set of vendors generated by other matchmaking and filtering processes (See related patented disclosure 1). Forming vendor coalitions involves multi-objective optimization, where the objectives might conflict with each other. Examples of such objectives include:

1. Meeting customer requirements at lowest cost
2. Delivering customer requirements in the shortest possible time
3. Forming coalitions that have the highest group dynamic coefficient.
4. Meeting customer requirements using vendors from a specific region

3. If the same advantage or problem has been identified by others (inside/outside IBM), how have those others solved it and does your solution differ and why is it better?
Using a manual approach based on industry knowledge, telephones, faxes, e-mail, etc. This approach is time-intensive and not scaleable

4. If the invention is implemented in a product or prototype, include technical details, purpose, disclosure details to others and the date of that implementation.

Dynamic Vendor Coalition Formation v2

***Critical Questions (Questions 1 - 7 must be answered)**

***Question 1** On what date was the invention workable? 08/04/2000 **Please format the date as MM/DD/YYYY** (Workable means i.e. when you know that your design will solve the problem)	
***Question 2** Is there any planned or actual publication or disclosure of your invention to anyone outside IBM?	○ Yes ● No
If yes, Enter the name of each publication or patent and the date published below. Publication/Patent: Date Published or Issued:	
Are you aware of any publications, products or patents that relate to this invention?	○ Yes ● No

If yes, Enter the name of each publication or patent and the date published below.
Publication/Patent:
Date Published or Issued:

*Question 3	
Has the subject matter of the invention or a product incorporating the invention been sold, used internally in manufacturing, announced for sale, or included in a proposal?	● Yes ○ No
Is a sale, use in manufacturing, product announcement, or proposal planned?	● Yes ○ No

If Yes, identify the product if known and indicate the date or planned date of sale, announcements, or proposal and to whom the sale, announcement or proposal has been or will be made.
Product: Virtual Enterprise Server
Version/Release:
Code Name:
Date:
To Whom: IBM Global Industries FOAK committee
If more than one, use cut and paste and append as necessary in the field provided.

*Question 4	
Was the subject matter of your invention or a product incorporating your invention used in public, e.g., outside IBM or in the presence of non-IBMers?	○ Yes ● No

If yes, give a date. **Please format the date as MM/DD/YYYY**

*Question 5	
Have you ever discussed your invention with others not employed at IBM?	○ Yes ● No

If yes, identify individuals and date discussed. Fill in the text area with the following information, the names of the individuals, the employer, date discussed, under CDA, and CDA #.

*Question 6	
Was the invention, in any way, started or developed under a government contract or project?	○ Yes ○ No ● Not sure

If Yes, enter the contract number

*Question 7	
Was the invention made in the course of any alliance, joint development or other contract activities?	○ Yes ○ No ● Not Sure

If Yes, enter the following :Name of Alliance, Contractor or Joint Developer

Contract ID number	
Relationship contact name	
Relationship contact E-mail	
Relationship contact phone	

Question 8	
Have you submitted, or are you aware of, any related disclosure submission?	○ Yes ● No

If Yes, please provide the title and docket or disclosure number below:

Question 9
What type of companies do you expect to compete with inventions of this type? *Check all that apply.*

- ☐ Manufacturers of enterprise servers
- ☐ Manufacturers of entry servers
- ☐ Manufacturers of workstations
- ☐ Manufacturers of PC's
- ☐ Non-computer manufacturers
- ☐ Developers of operating systems
- ☐ Developers of networking software
- ☒ Developers of application software
- ☒ Integrated solution providers
- ☒ Service providers
- ☒ Other (Please specify below)

Solution providers for e-markets of engineered to order products and services

Patent Value Tool (Optional - this may be used by the inventor and attorney to assist with the evalu

(The Patent Value tool can be used by you or the evaluation team to determine the potential licensing value of your invention.)

The **Patent Value Tool** has not yet been used to calculate a score.

Post Disclosure Text & Drawings

Enter any additional information relating to this disclosure below:

A Method and System for Forming Dynamic Vendor Coalitions in Collaborative e-Commerce

Problem Solved by This Invention

In today's dynamic net-generation business environment, the window of opportunity is shrinking for many businesses due to the time and space compression effect of the Internet. In the face of intense competition, businesses are faced with the need to rapidly re-configure themselves over and over again as they strive to introduce new products and processes. In this paper, we present an alternative to business re-configuration, namely formation of dynamic alliances. Dynamic networks of alliances (or coalitions) are formed between vendors with complementary capabilities to jointly pursue specific market opportunities. Such alliances are created primarily for the purpose of satisfying a market opportunity and disbanded after the opportunity has been satisfied. Although most alliances will be short-term in nature, traditional long-term business relationships can also evolve in some cases. We are currently developing the Internet infrastructure and process to support the formation of dynamic alliances to be implemented through our Virtual Enterprise Server. This invention describes a unique method for formation of dynamic vendor coalitions over the Internet.

The Invention

The invention is a process and a system for forming dynamic vendor coalitions from a pre-qualified set of vendors. It is assumed that the input for vendor coalition formation is pre-qualified set of vendors generated by other matchmaking and filtering processes (See related patented disclosure 1). Forming vendor coalitions involves multi-objective optimization, where the objectives might conflict with each other. Examples of such objectives include:

1. Meeting customer requirements at lowest cost
2. Delivering customer requirements in the shortest possible time
3. Forming coalitions that have the highest group dynamic coefficient.
4. Meeting customer requirements using vendors from a specific region

Single-Level Coalition Formation Problem

An overview of the single-level, vendor coalition formation problem between a customer and several vendors is shown in Figure 1. An incoming buyer request (RFP) is converted into a set of demanded capabilities through capability translation and matchmaking. For each demanded capability, a set of potential vendors is selected to whom invitations can be sent out. The coalition formation process determines optimal groups of vendors for each of the demanded capabilities. It also determines the optimal group of vendors for the entire project requiring several demanded capabilities. There are a few points to observe regarding this process.

1. Each demanded capability will have a shortlist of selected vendors who have been selected on the basis of matching their known (registered) capabilities with demanded capabilities.

2. One vendor may be able to provide more than one demanded capability as pictorially depicted in Figure 1. For example, Vendor V1 can provide demanded capabilities DC1 and DC2.

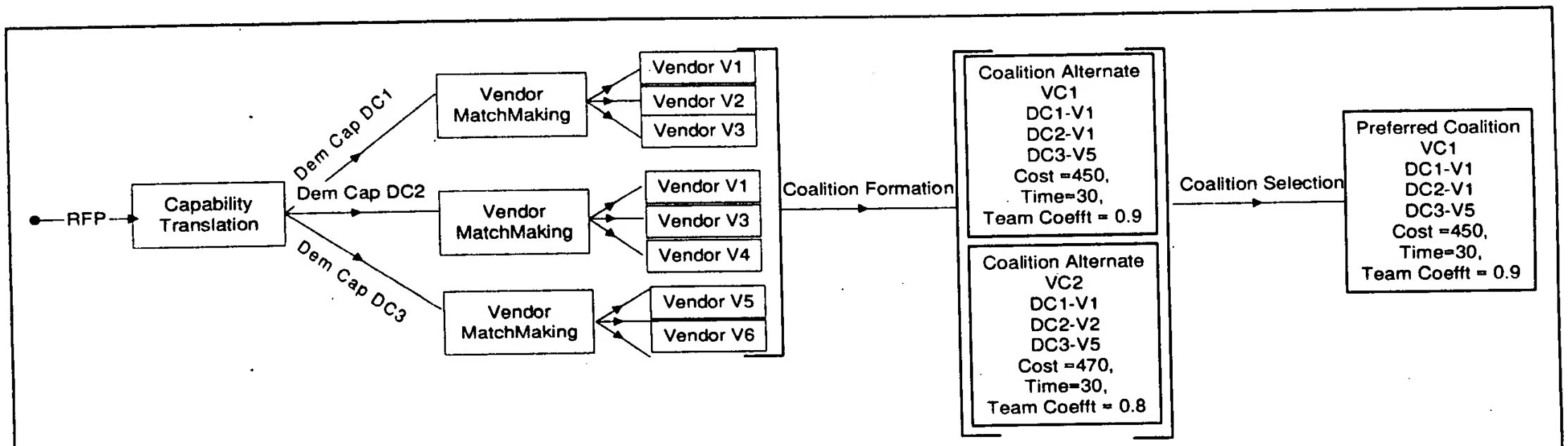

Figure 1. Vendor Coalition Formation and Selection Process

Here, the formation of vendor coalitions when one vendor provides more than one demanded capability is a complex problem. In Figure 1, two potential solutions for this coalition formation problem are:

1. Select V1 to satisfy both DC1 and DC2, Select V5 to satisfy DC3
2. Select V1 for DC1, V2 for DC2, V5 for DC3.

Assuming that these vendors have sufficient capacity to meet the imposed demand, both of the above solutions are feasible. However, the cost associated with them may not be the same. The total cost of solution 1 might be lower because V1 provides a lower price on the combined bid for DC1 and DC2. Also, solution 2 might be delivered quicker because three different vendors who take a smaller amount of time together to satisfy all demanded capabilities. It is immediately apparent that there a combinatorial number of feasible solutions exist for the coalition formation problem each with an associated cost or duration to deliver. Developing an optimal solution will involve searching the entire space of solutions which can be prohibitive in terms of computation time. Therefore, implicit solution space spanning techniques are developed to solve this decision support problem.

Multi-Level Coalition Formation Problem

When incoming RFx (i.e. RFP or RFQ) requirements are complex, they can be broken down into smaller sets of requirements. This task is usually performed by a systems integrator. The incoming RFx is split into multiple RFx's based on some criteria. The systems integrator generates sub-RFx's which are then passed onto downstream capability translation, matchmaking and coalition formation processes as shown in Figure 2. In this situation, vendor coalitions are of a hierarchical nature depending on how many RFxs the original RFx generated. In this case, there are two categories of coalitions:

1. Single-level coalitions that are formed at each parent RFx node in the RFx tree. At each level in the tree, a vendor coalition can be generated that optimally meets the requirements of the parent Rfx node
2. The overall multi-level coalition for the total project (based on incoming RFx) that incorporates all hierarchies.

Local vs. Global Algorithm

Coalition formation in the hierarchical situation can be either of either local or global scope. When coalitions are formed within local scope, local information within the current level in the tree is used to optimize the coalition at the current node. Results are then passed back to the parent node. The overall combination of vendors and the associated metrics of the chosen coalitions is obtained by aggregating the optimization results of the individual nodes in the tree. When vendor coalitions are formed globally, no coalition formation decisions are made at the local level. Based on the selections performed during the matchmaking process, vendor invitations are sent out. Based on the vendor responses received, global optimization may be performed by looking at the entire tree to decide how coalitions will be formed at each level in the tree rather than aggregating the results of decisions made at individual nodes.

Potential Use

This invention can be used in electronic marketplaces where buyer requirements cannot be met completely by any single vendor. In such a case a coalition of vendors can be formed to deliver the customer requirements by jointly leveraging the capabilities of individual vendors. Such requirements are common in project-oriented industries where development of engineered-to-order products and services is quite usual. Here a system integrator works with vendors specializing in various capabilities and puts together a proposal for the customer. Another potential area for usage of this invention would be for new product or service introduction (NPI) into a market, irrespective of the industry. Here a company with an idea can rapidly assemble a team of specialists to convert the idea into reality. The NPI process again usually tends to be very project-oriented in nature.

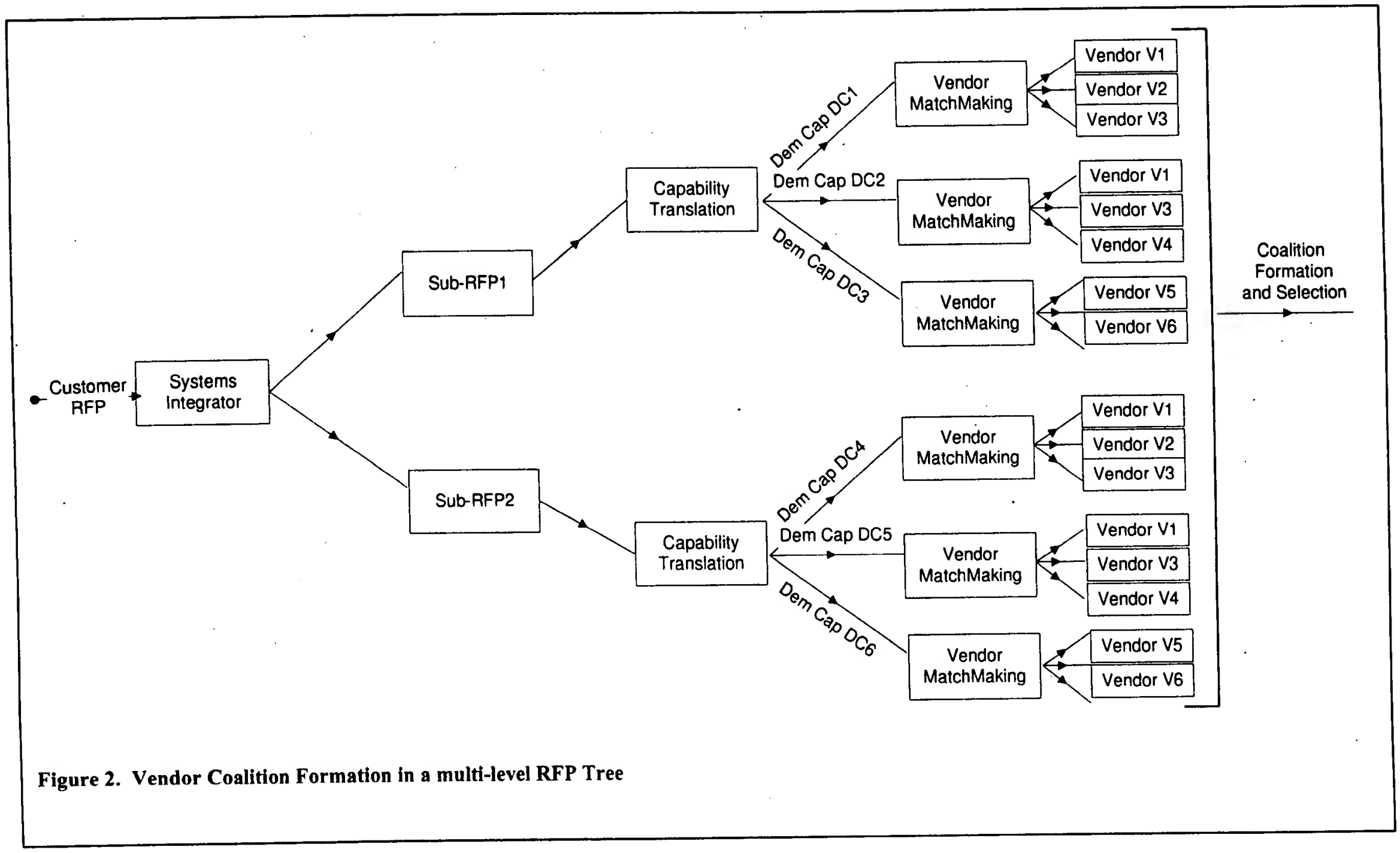

Figure 2. Vendor Coalition Formation in a multi-level RFP Tree

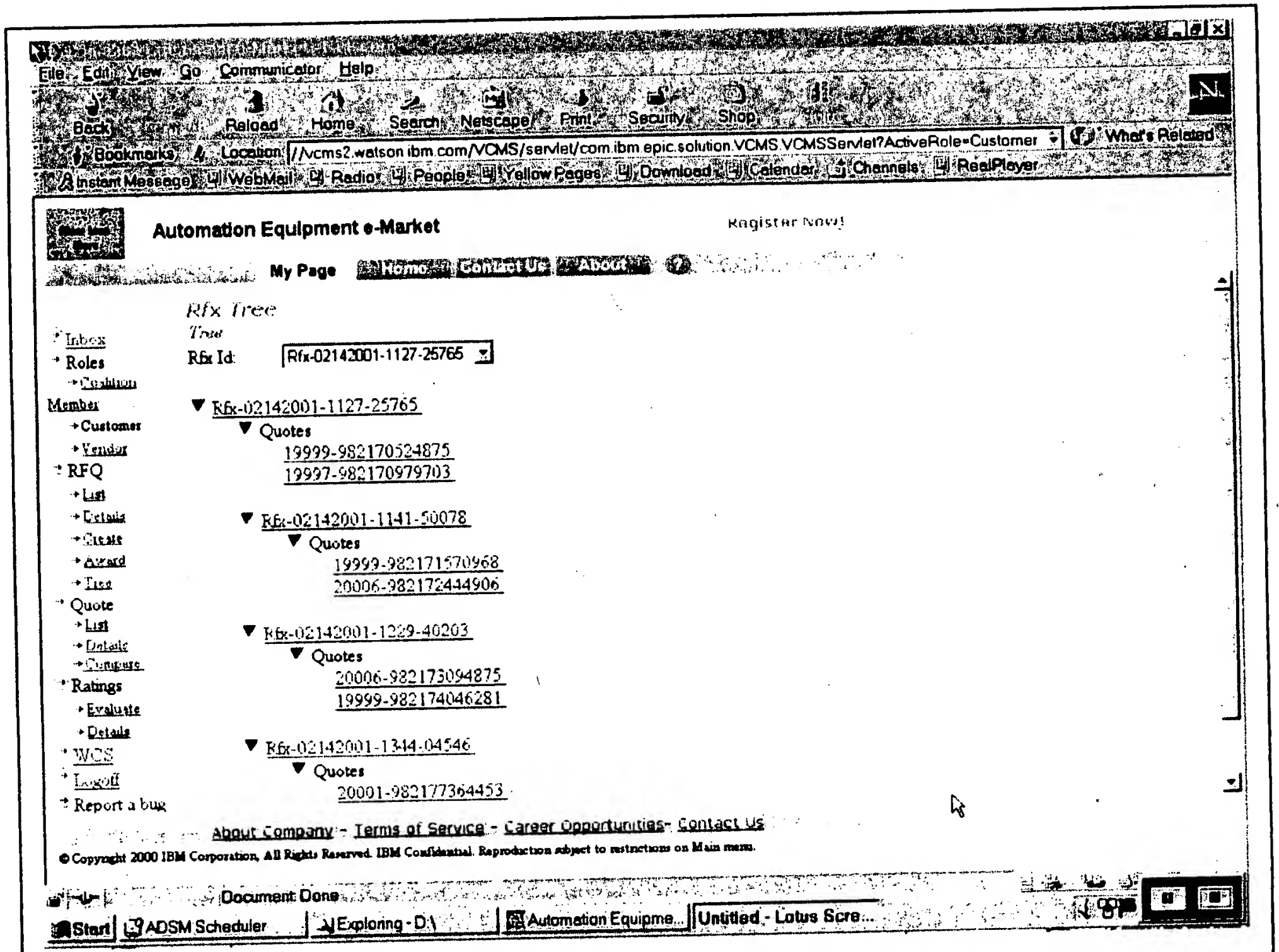

Figure 2. A 2-level RFx tree created from dividing original RFP serial Rfx-02142001-1127-25765 into 3 sub-requests

EXHIBIT B

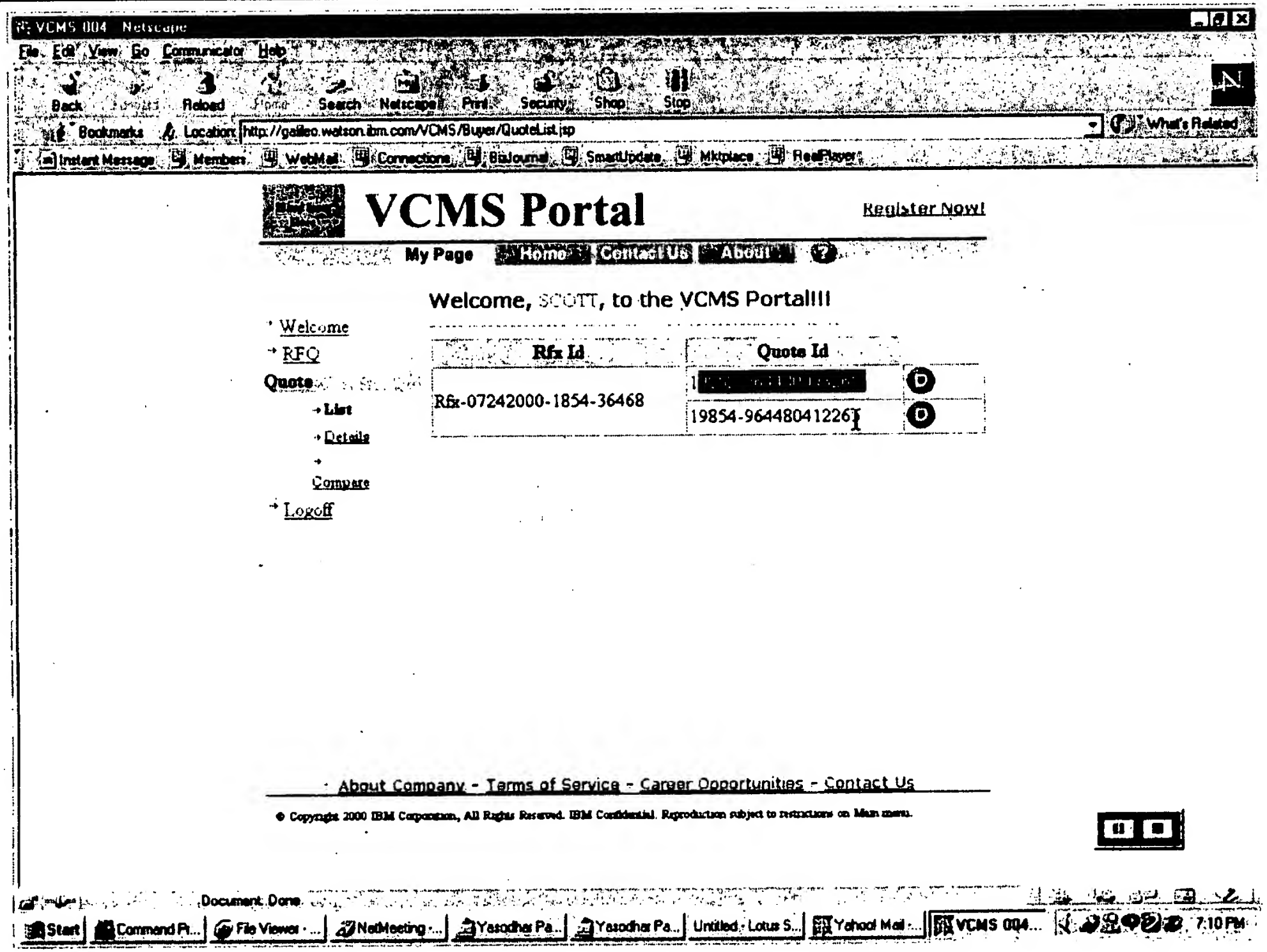

Figure 1. July 24, 2000 screencam of VCMS software showing customer "Scott" accessing quotes from two vendors in response to his RFP

EXHIBIT C

EXHIBIT

D

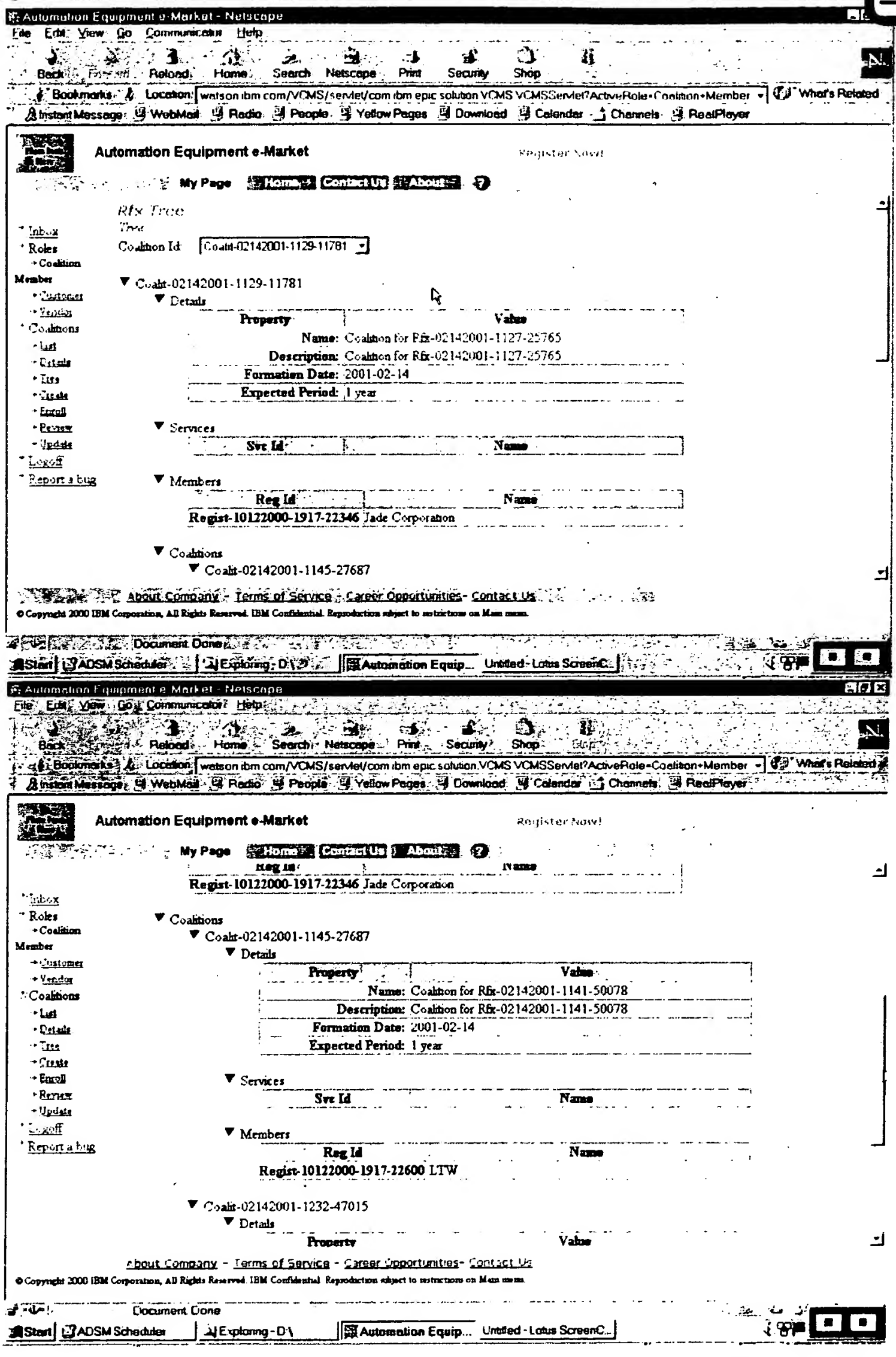

Figure 3. A 2-level coalition tree showing a vendor "Jade Corporation" creating coalition with other vendor "LTW" to respond to original RFP serial Rfx-02142001-1127-25765